An Annotated Bibliography and Information Summary on The Fisheries Resources of the Yukon River Basin in Canada

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(Yukon River Basin Study Project No. 31)

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June 1982

Canadian Manuscript Report of
Fisheries and Aquatic Sciences
No. 1657

Government of Canada
Fisheries and Oceans

Gouvernement du Canada
Pêches et Océans

2008-05987/

Canadian Manuscript Report of Fisheries and Aquatic Sciences

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AN ANNOTATED BIBLIOGRAPHY AND INFORMATION SUMMARY ON THE FISHERIES RESOURCES OF THE YUKON RIVER BASIN IN CANADA

by

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Minister of Supply and Services
Cat No. Fs 97-4/1657 ISSN 0706-6473
Correct citation for this publication:

Ennis, G.L., A. Cinader, S. McIndoe, and T. Munsen. 1982. An annotated bibliography and information summary on the fisheries resources of the Yukon River Basin in Canada. Can. MS Rept. Fish. Aquat. Sci. 1657: V + 278 p.

TERMS OF REFERENCE

This study was undertaken to provide background information for the Fisheries Work Group of the Yukon River Basin Study. The Basin Study is a joint study by Canada, B.C., and Yukon of the water and related resources of the Yukon River Basin.

The fisheries information study forms project No. 31 of the Yukon River Basin Study. The Terms of Reference (Project Description) for the fisheries information study follows:

PROJECT DESCRIPTION: This study will provide a description of the fisheries resources of the Yukon Basin by:

(1) Compiling existing fisheries information from periodicals, university theses, government and industrial technical reports, mapping projects, and government records (open files, field notes, unpublished or incomplete studies, etc.).

(2) Reviewing and evaluating the quality of the information.

(3) Producing a document which:

- (a) provides an annotated bibliography of the information (by sub-basin) including comments on the quality and usefulness of the existing information;
- (b) discusses and synthesizes the reports focusing on fish processes existing in the Basin, the applicability of the existing information, data gaps, and a summary of relevant recommendations and conclusions from the reports that were reviewed;
- (c) provides documentation of other data basis for reference, the location of referenced material and scope of the material referenced;
- (d) maps of the watershed displaying fish species distribution and abundances.

The annotated bibliography and information summary on the following pages fulfills objectives 1, 2 and 3, a, b, c of the Terms of Reference. As a point of clarification on objective 3b we found it impractical to summarize data gaps and recommendations from individual reports and have instead made general statements on data gaps and recommended studies for each sub-basin after reviewing the relevant information. The summaries and recommended studies are those of the authors and not necessarily those of the Yukon River Basin Committee, Parties to the Basin Agreement or the Department of Fisheries and Oceans.

Fisheries resource maps were separately produced to fulfill objective 3d of the Terms of Reference. These maps may be ordered from the Department of Fisheries and Oceans (contact G.L. Ennis).

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ABSTRACT

Ennis, G.L., A. Cinader, S. McIndoe, and T. Munsen. 1982. An annotated bibliography and information summary on the fisheries resources of the Yukon River Basin in Canada. Can. MS Rept. Fish. Aquat. Sci. 1657: V + 278 p.

This annotated bibliography provides a listing of 223 fisheries reports pertaining to the Canadian portion of the Yukon River and its tributaries (exclusive of the Porcupine River). Sources for the bibliography include periodicals, government and industrial technical reports and government records. Identification of source materials was facilitated by a computer search of several data bases.

The bibliographic information is listed alphabetically by author and cross-referenced under the following sub-basin headings: Yukon River mainstem, White River, Stewart River, Pelly River and Teslin river. The Aishihik River Basin was also referenced as there are existing proposals to divert water bodies of the Yukon system into the Aishihik system. Information collected for each sub-basin has been summarized and evaluated according to its applicibality to the Yukon River Basin Study objectives. Data gaps are identified and some additional studies suggested for each sub-basin.

References which were not received in time to be annotated are listed alphabetically.

Alternative sources of fisheries information for the Yukon Basin such as other bibliographies and mapping projects are listed in a separate section.

RÉSUMÉ

Ennis, G.L., A. Cinader, S. McIndoe, and T. Munsen. 1982. An annotated bibliography and information summary on the fisheries resources of the Yukon River Basin in Canada. Can. MS Rept. Fish. Aquat. Sci. 1657: V + 278 p.

Cette bibliographie annotée donne une liste de 223 exposés en pêcherie ayant rapport à la rivière Yukon et ses tributaires (à l'exclusion de la rivière Porcupine). Les référénces bibliographiques proviennent de périodiques, de rapports techniques governementals et industriels ainsi que des archives de governement. L'identification du matériel de référénce fut facilité par une recherche sur ordinateur de plusieurs lignes de repère.

L'information bibliographique est organisée en ordre alphabétique par auteur et les renvois sont cataloqués sous les titres des sous-bassins suivants: la parti principale de la rivière Yukon, la rivière White, la rivière Stewart, la rivière Pelly et la rivière Teslin. Le bassin de la rivière Aishihik fut aussi classifié car il existe des soumissiones pour dévier des masses d'eau du réseau Yukon dans le réseau Aishihik. L'information recueilli de chaque sous-bassin fut résumé et évalué selon l'applicabilité aux objectifs de l'Étude du Bassin de la Rivière Yukon. L'écart des donnés fut identifié et des études additionnelles furent suggérées pour chaque sous-bassin.

Les référénces réçues trop tard pour être annotées sont cataloguées en ordre alphabétique.

Des soures alternatives d'informaiton relié au sujet de pèche pour le bassin du Yukon -- telles que certaines bibliographies additionnelles et des projets cartographiques -- sont cataloguées dans une section supplémentaire.

ACKNOWLEDGEMENTS

A number of people have helped with this report. We would like to thank the librarians at Fisheries and Oceans, Paulette Westlake and Marcia Waldron, for their kindness and assistance in locating references. We also thank the many librarians from other Fisheries' libraries, other agencies and private industry that supplied us with information. Staff of the Habitat Management Division, Department of Fisheries and Oceans, provided reference material not otherwise available. Sandy Johnston of Fisheries in Whitehorse made valuable suggestions for summarizing the sub-basins, for which we are grateful. Bill Parker, of Woodward Library, University of British Columbia, conducted the computer searches. We thank Donna Lee, Thelma Collins and Patricia Benoit for typing the bibliography.

Funding for the project was provided by the Yukon River Basin Study and we thank the Study Director, W.G. Whitley, for his help and encouragement.

INTRODUCTION

This annotated bibliography provides a listing of fisheries and fish-related information pertaining to the Canadian portion of the Yukon River and its tributaries (exclusive of the Porcupine River). Sources for the bibliography include periodicals, government and industrial technical reports and government records.

Identification of source materials was facilitated by a computer search of the following data bases: QL, CANOLE, and DIALOG. Three QL files were searched: Canadian environment (CENV), Arctic Sciences and Technology (AST) and Boreal Northern Titles (BNT). Four CANOLE files were searched: Biological Abstracts (BA), NTIS, Environment Canada Departmental Library (ELIAS), and Directory of Federally Supported Research in Universities from the Information Exchange Center (IEC). One DIALOG file was searched: Pollution Abstracts.

The bibliographic information is listed alphabetically by author and cross-referenced under the following sub-basin headings: Yukon River mainstem, White River, Stewart River, Pelly River and Teslin River. The Aishihik River Basin was also referenced as there are existing proposals to divert water bodies of the Yukon system into the Aishihik system. Information collected for each sub-basin has been summarized and evaluated according to its applicibality to the Yukon River Basin Study objectives. Data gaps are identified and some additional studies suggested for each sub-basin.

References which were not received in time to be annotated are listed alphabetically after the first list of references.

Alternative sources of fisheries information for the Yukon Basin such as other bibliographies and mapping projects are listed in a separate section.

Most of the abstracts in this bibliography were prepared by the authors of the articles. However, studies for which no abstracts were available were summarized by the authors of this report. In some cases, abstracts did exist but did not outline the important information from a fisheries point of view. In these cases, the studies were summarized by the authors of the bibliography.

The authors apologize for any errors or ommissions that may have occurred and would appreciate receiving comments and other relevant Yukon River Basin information and reports.

ANNOTATED YUKON BASIN TITLES

#1

Acres Consulting Services in association with IEC International Environmental Consultants Ltd. 1982. McInytre Creek Power Plant No. 3 - feasability study. Final report prepared for the Yukon Electrical Company Ltd. January, 1982. 77 pages.

Abstract

Yukon Hydro is proposing a hydro-electric development which would include a forebay formed by an earthfilled dam located between the Whitehorse pumping station and the Alaska Highway on McIntyre Creek. Water would be conveyed via a penstock to the powerhouse located below the junction of Range and Porter Creek roads. The powerhouse would be located on the valley slope of the Yukon River floodplain. A tailrace channel would convey water from the powerhouse to the main channel of the Yukon River.

This report summarizes the engineering and environmental feasibility of the potential development, and includes the results of a habitat assessment and fisheries survey conducted between September 14th and 19th on McIntyre Creek.

Juvenile chinook salmon were found in the area below Range Road and above the estuary. The most abundant species in McIntyre Creek, other than sculpin, were rainbow trout. Trout were found in all reaches, except in reach 1 where juvenile salmon were found, and pool and riffle areas were thought to provide good trout spawning and nursery habitats. Grayling didn't appear to be abundant in the study area, and no juveniles were captured. Barriers in McIntyre Creek prevent upstream migration of fish.

The report concludes that fish habitat, including some salmon rearing habitat in lower McIntyre Creek, would be lost with the development. It is suggested that fish be stocked in and above the proposed headpond as this area will have a greater sports angling potential.

An appendix lists species, weight, age, length and location of fish captures.

#2
Acres Consulting Services Ltd. in association with IEC International Environmental Consultants Ltd. 1981. McIntyre Creek Power Plant No. 3 Prefeasibility Study Report prepared for the Yukon Electrical Company Limited. 42 pages.

Abstract

The Yukon Electrical Company has made a proposal to place a dam at one of three alternative dam sites on McIntyre Creek. The first and second alternatives would see a dam located adjacent to the city pumping station (Alternative 1) or slightly upstream (Alternative 2) with a penstock leading to a power plant located at the foot of the escarpment in the vicinity of the new Porter Creek access road cut along the escarpment. The third alternative (Alternative 3) is downstream from the city pumping station.

This study is a preliminary evaluation of Power Plant No. 3 and includes a short section on fisheries concerns.

Existing data indicates that McIntyre Creek supports a grayling population and provides some rearing habitat for Chinook salmon fry.

McIntyre Creek was surveyed on foot from the Alaska Highway to the Yukon River and suitable fish habitat was evaluated in terms of the rate of water flow and slope gradient of various sections of the creek. It was concluded that the dam will result in the loss of some suitable grayling and rainbow trout habitat but the head pond may provide some replacement habitat.

The Department of Fisheries and Oceans plans to construct a salmon hatchery in the vicinity of the pumphouse. While this will not necessarily be incompatible with the ECL hydro proposal a number of key issues will require resolution. These issues are summarized in the report.

#3
Alaska Highway Pipeline Panel 1979. Initial impact assessment: Dempster Corridor. 300 pages.

Abstract

This report deals with the impacts on the biological, physical and human environments which would result from the construction and operation of the proposed Dempster Highway gas pipeline. The proposed pipeline will be at least 30 inches in diameter and will require initially 4 compressor stations. The construction work force will approximate 3000 people. The permanent work force will consist of 100 people. The environmental evaluation has been approached by examining three major components of the physical environment; land, water, and air; four major components of the biological environment; mammals, birds, fish and vegetation; and a heritage and land-use component of the human environment. Each component has been reviewed in terms of the changes it will undergo as a result of pipeline construction and highway use. In addition resource management problems and prospects are reviewed. The report stresses the need to view the pipeline development as just one part of an ongoing development process for the Mackenzie Delta. The effect of the pipeline must also be considered in respect to the already onstructed Dempster highway which has on its own, a potential impact on the porcupine caribou herd. The single most important action required is to establish immediately a regional development planning and impact management process for the entire area that would permit anticipatory response or direction to events before the event occurs. Appendices to the report discuss the following topics: 1. the porcupine caribou herd and the impact of the Dempster corridor, 2. public involvement in managing the impact of the pipeline, 3. the impact of the Dempster corridor on the Mackenzie Delta, and 4. socio-economic data of the Delta and Dempster segments.

#4

Archibald, P. L. and B. E. Burns. 1981. A baseline survey of the water quality and biological conditions in the streams of the Howard's Pass area, Yukon Territory. Canada, Department of the Environment, E.P.S. Manuscript Report 81-13. 63 pages.

Abstract

A pre-development survey of water quality, sediment composition and biological conditions in the streams of the Howard's Pass area was conducted in July, 1980. The purpose of the survey was to obtain baseline information on the environmental quality of streams in the area around a large lead/zinc ore body which is expected to be developed as a mine. The study area incorporated three contiguous blocks of mineral claims belonging to Placer Developments Limited, and the streams draining them. Fish were sampled at three of the seven sampling stations using the angling method. Station 1 was located on an unnamed stream draining into the Pelly River, station 4 was situated on an unnamed stream just above the confluence with Don Creek and station 7 was located on Don Creek. The objective of the fish sampling was to obtain fish samples for metals analysis, rather than to assess the abundance and diversity of fish. However, the fact that grayling were collected so easily indicates that the area, particularly near station 4, may be a very productive grayling area.

The benthic macroinvertebrates and fish sampling results were representative of generally clear, unpolluted mountain streams. The high zinc concentrations in the stream sediments sampled reflected the presence of zinc ore deposits in the area.

#5

Arthur, J. R., L. Margolis and H. P. Arai, 1976. Parasites of fishes of Aishihik and Stevens lakes, Yukon Territory, and potential consequences of their interlake transfer through a proposed water diversion for hydroelectrical purposes. J. Fish, Res. Board Can. 33:2489-2499.

Abstract

Forty-six species of parasites were recovered from 383 specimens of 8 species of fishes collected from Aishihik and Stevens lakes during the summer of 1973. Substantial differences in the parasite fauna of Aishihik and Stevens lakes are noted; the possible consequences of the introduction of species of potential economic and pathogenic importance into new areas as a result of the proposed diversion of Stevens Lake (Yukon River system) into Aishihik Lake (Alsek River system) are discussed. Factors that must be given attention include preventing the transfer of infected fishes, infected intermediate hosts, free-swimming larval stages, and contaminated host waste products.

#6

Baker, S. 1980. Environmental concerns and recommendations: Alaska Highway reconstruction and maintenance, Kilometre 1008-1635. Environmental Impact and Assessment Report. EPS 8-PR-80-1. 94 pages.

Abstract

Environmental concerns associated with Alaska Highway reconstruction and maintenance practices in the Yukon and practices which might be useful in resolving concerns are identified in this report.

Although this information is applicable to Yukon highways in general, the focus of this report is on:

(i) Alaska Highway widening and paving between Watson Lake and Haines Junction,

(ii) Relocation of certain sections of Alaska Highway between Watson Lake and Haines Junction,

(iii) Alaska Highway maintenance pactices between Watson Lake and Haines Junction.

Recommendations for specific sites on this stretch of highway were made during the study and may be obtained from the Environmental Protection Service, Whitehorse, along with brief site descriptions which complement the more general information contained in this report. No new fisheries data is included.

#7

Baker, S. A. 1980. In situ bioassay study at a gold placer mining area in Yukon using Arctic grayling. In: Weagle, K. 1980, Report on the technical workshop on suspended solids and the aquatic environment. Department of Indian Affairs and Northern Development. 10 + pages.

Abstract

The study was conducted primarily as an experiment with the technique of in-situ bioassays. Eight stations were selected on placer mined creeks in the Dawson area, including Hunker Creek, Bonanza Creek, and Klondike River. Bioassay cages were set up for the time period of September 23, 1979 to September 19, 1979 and monitored, as were various water quality parameters including dissolved oxygen, suspended sediments and metals.

The results, although by no means conclusive, indicated an inverse correlation between elevated suspended sediment concentration, fish survival and dissolved oxygen concentration.

#8

Baker, S. A. 1979. An environmental survey of selected Yukon river headwater lakes impacted by communities. Canada Department of Environment. EPS Regional Program Report No 79-26. 75 pages.

Abstract

Water chemistry data and bottom fauna samples were collected from six Yukon lakes in the summer of 1977. The lakes sampled were; Tagish Lake on August 11 and September 26, at five sampling stations, Bennett Lake and Nares Lake on July 4 and September 9, at eight stations, Teslin Lake on July 2 and September 7, at eight stations, Marsh Lake on August 8 and September 13 at seven stations, Lake Laberge on July 3 and August 29 at eight stations, Kluane Lake at Burwash Landing on July 7 at eight stations, and Kluane Lake at Destruction Bay on July 9, at eight stations.

Water samples were analyzed for bacteria, nutrients, metals, mercury and arsenic content. Invertebrate data was collected and diversity and evenness values were calculated. High dissolved oxygen contents and the absence of any significant concentrations of deleterious substances characterized the waters of these oligotrophic lakes. All exhibited low concentrations of metals with only a few exceptions, probably attributable to natural mineralization. The more populated areas such as the Carcross area (Nares Lake), Marsh Lake cottage areas, Lake Laberge (Deep Creek), and Kluane Lake near Burwash Landing all had countable coliform results. Most invertebrate communities shared the characteristics of low diversity (relative to southern waters) and moderate evenness. The benthic community composition described in this survey was found to be similar to results found by Withler (1956) on Atlin and Tagish Lakes, Clemens et al (1968) on Teslin Lake and Kussat (1972) on Aishihik Lake. The biological data may be considered to be typical of an unpolluted northern freshwater system. Invertebrate species presence and water chemistry data are summarized in tables. This report contains no fisheries data.

#9

Baker, S. A. 1979. A survey of environmental mercury concentrations in Yukon Territory. Canada Department of Environment, E.P.S. Regional Program Report No. 79-21. 74 pages.

Abstract

The Yukon mercury survey was set up to establish a data base of mercury concentrations throughout the Territory. Samples of fish muscle tissue, sediment and water were obtained from thirty eight water bodies around the Yukon. The fish species found included arctic grayling, lake trout, northern pike, lake whitefish round whitefish, burbot, longnose sucker, coho salmon, sockeye salmon, chum salmon, chinook salmon and lake cisco.

Several moose tissue and waterfowl tissue samples were also analyzed for mercury concentration. The general finding of the survey was that the Yukon is problem free in terms of mercury contamination, although there are a few areas with naturally elevated concentrations. Areas of possible concern were labelled as those where sediment concentrations were greater than or equal to 500 ppb Hg and/or fish tissue mean concentrations were greater than or equal to .30 ppb. The areas identified by these criteria were Fox Lake, Francis Lake, Lake Laberge, Little Atlin Lake, Mayo Lake, Porcupine River, Quiet Lake, Simpson Lake, Teslin Lake and, possibly Atlin Lake. Each of these lakes supports either sport fishing, commercial fishing or native fishing. A discussion of the interpretation of the impact of mercury on fish, and the interpretation of the results of mercury on fish as documented in previous studies, is included. There is no evidence of anthropogenic mercury pollution in Yukon.

#10
Baker, S. A. 1977. Environmental quality of Rose Creek as affected by Cyprus Anvil Mining Corporation Ltd., (Survey data from 1974, 1975 and 1976). Canada, Department of Environment, E.P.S. Regional Program Report No. 79-25. 138 pages.

Abstract

Water quality, benthic invertebrates and fish surveys were conducted within the Rose Creek watershed during 1974 through 1976. The ten sampling sites were located upstream and downstream of the mine on Rose Creek and on Anvil and Pelly Creeks. Fish were collected using an electrofisher, with a barrier net downstream. The fish obtained were counted and identified and the dorsal tissue and liver tissue were sampled for heavy metal concetrations. Very few fish were collected in Rose Creek, probably due to the effect of the continuous tailings pond discharge into the creek. The low number of fish in 1974 was probably due to a high silt load from Faro Creek prior to the completion of the diversion channels. Stations on Anvil Creek and Pelly River located at some distance from the mine produced the greatest number of fish and the most species. The fish species collected at all sampling sites from 1974 to 1976 included 30 arctic grayling, 48 slimy sculpin, 19 round whitefish, 2 humpback whitefish, 7 longnose suckers, 4 burbot and 11 chinook salmon.

Results of the study indicated that the water quality of Rose Creek has been adversely affected on many occasions by the activity of the mine. In some cases the effluent concentrations were within acceptable limits.

#11

Beak Consultants Ltd. 1980. An initial environmental assessment of the Jason property, MacMillan Pass area, Yukon Territory. Prep. for Pan Ocean Oil Limited. 66 pages.

Abstract

The Jason property is situated in the vicinity of two major drainage systems, the South MacMillan and Hess Rivers. A preliminary environmental assessment is presented, based primarily on the literature and on a one-day visit on July 8, 1980.

Water quality data collected in 1976, 1977 and 1978 from the South MacMillan River and its immediate tributaries indicates that, in general, water chemistry does not appear to be limiting to fish life. Examination of substrates at several MacMillan sites as well as on Sekie Creek indicated the presence of stoneflies, mayflies and Dipteran larvae, all of which may serve as food for resident fishes. Fisheries and Marine Service information indicates that Arctic grayling, round whitefish, slimy sculpin and lake trout are present in the South MacMillan system. Beak observed the South MacMillan from below to above the property perimeter by helicopter but no fish were observed. There is potential for northern pike and chum salmon to be found in the South MacMillan as they have been collected in the MacMillan River proper. Sekie Creek, near the base camp exhibited good fish habitat up to the Canol Road, above which gradients increased markedly and substrates consisted primarily of large boulders. A tributary to the Hess River draining northwest from Jason Property consisted of a narrow, relatively steep gradient channel, flowing over primarily large cobble/boulder substrates. Given the elevation and configuration of this tributary, it is doubtful that fish would be present in this river near the property.

#12

Beak Consultants Ltd. 1980. Summary of fisheries investigations of new crossing locations, Alaska Highway Gas Pipeline, Yukon Territory, 1979. Prepared for Foothills Pipe Lines (Yukon) Ltd. 92 + pages.

Abstract

Recent changes in the prime route alignment of the Foothills Pipe Line have resulted in new waterbody crossings at both the eastern and western extremities of the pipeline route in the Yukon Territory. Beak Consultants Limited were retained to conduct fisheries investigations, during the 1979 open-water season, of the new watercrossing locations. The quality of the habitat available for utilization by fish was determined at each watercrossing investigated. The fishery sampling effort expended on each stream was determined by the number and proximity of previous crossings of the same stream, and the quality of habitat and fish fauna present. the species considered important in this area of the Yukon Territory are chinook salmon, chum salmon, Arctic grayling, lake trout, lake whitefish, and Dolly Varden char. Northern pike and burbot were also included in discussions of the fish fauna of the streams. In general, streams not previously crossed exhibited limited utilization by fish.

#13

Beak Consultants Ltd. 1979. Fisheries investigations along the Dawson Trail segment of the Dempster Lateral gas pipeline route, Yukon Territory, 1979. Report prepared for Foothills Pipe Lines (Yukon) Ltd., Calgary, Alberta. 32 + pages.

Abstract

Between KP 1100 and KP1200 of the proposed Dempster Lateral gas pipeline route, the alignment would proceed through valleys drained by the Klusha and Thirty-seven Mile Creek systems. Klusha Creek would be crossed six times and Thirty-seven Mile Creek crossed once by the proposed route. Both watercourses would be paralleled for several kilometres and some of the lakes associated with these drainages would be bypassed within several hundred metres. Surveys of proposed crossing sites, selected areas of Klusha and Thirty-seven Mile Creeks and representative lakes were conducted in May and September, 1979, in order to assess potential impacts of the proposed development on the regional fisheries resource.

Klusha Creek provides excellent rearing and summer habitat for Arctic grayling and burbot. Data suggest that Arctic grayling spawn near the proposed crossing site at KP1124.2, but suitable spawning substrate was not observed at any site farther upstream on this system. Lakes provide year-round habitat for several species, most noticeably lake trout, lake whitefish, Arctic grayling, northern pike and burbot. Pothole lakes not connected to the creek appear to be void of fish. The proposed crossing site on Thirty-seven Mile Creek does not provide suitable habitat for use by fish species. The lower reaches of this watercourse provide rearing and summer habitat for Arctic grayling. Lakes within this system are utilized by lake trout, lake whitefish, arctic grayling and burbot.

#14

Beak Consultants Limited 1979. Fishery resource investigations of waterbodies within the influence of the Alaska Highway gas pipeline. Alternative alignments, 1978. 2 Volumes. Report prepared for Foothills Pipe Lines (South Yukon) Ltd. Calgary, Alberta. 267 + pages.

Abstract

This report presents the results of fisheries surveys conducted in waterbodies within the influence of alternative pipeline routes.

Alternative alignments in the Kluane Lake, Whitehorse and Mount Michie Squanga areas were examined in the spring (May 15 - June 7), summer (August 3 - 25) and autumn (September 22 - October 7, and October 24, - November 6). Additional alternative alignments in the Kluane Lake, Whitehorse regions and Pickhandle Lakes area were examined only in the autumn.

The purpose of the study was to collect data on species distribution and habitat utilization.

Results are presented and maps of the alternative alignments are included.

Volume 2 contains data summary sheets for waterbodies examined during the studies.

#15
Beak Consultants Ltd. 1979. Surveillance of selected watercourse crossings along the Alaska Highway gas pipeline route in Yukon Territory, Year 1 (1978). Prepared for Foothills Pipe Lines (South Yukon) Ltd., Calgary. 57 + pages.

Abstract

A field survey of six watercourses along the Alaska Highway gas pipeline was carried out to collect data on water quality, benthic macroinvertebrates and fish species. The six watercourses studied were Beaver Creek (KM 23.8), Marshall Creek (KM 309.8), M'Clintock River (KM 472.8), Koidern River (KM 101.4), Morley River (KM 630.1), Rancheria River (KM 730.6).

Fisheries information on species presence, abundance and habitat utilization was collected during weekly visits to the watercourses between May 1 - June 30, 1978 and bi-weekly investigations between July 1 - September 30, 1978.

#16
Beak Consultants Ltd. 1977. A preliminary inventory of fish resouces in southern Yukon Territory, 1976. Prepared for Foothills Pipe Lines (South Yukon) Ltd. 13 pages.

Abstract

Foothills have proposed the development of a natural gas pipeline that would traverse the southern section of the Yukon Territory. The construction, maintenance and operation of this pipeline has the potential for serious impairment of aquatic environments. Two field surveys were conducted by BEAK from 22 September to 1 October, and 22 - 27 October, 1976. The purpose of these surveys was to provide additional information on the fish resources of selected aquatic systems in southern Yukon Territory, with emphasis on the identification and enumeration of fall spawning habitat and its utilization. Although all fall spawning fish species were considered in this study, of particular concern was the determination of whether chinook and chum salmon spawning areas could be impacted by the proposed pipeline. Rivers surveyed were restricted to those that were known or suspected to support fall spawning activity. Methods employed to locate fall spawning habitat included the use of seine nets, electrofisher, angling, aerial reconnaissance and the location of redds at the proposed pipeline river crossing and downstream locations. Numbers of fish collected in this study were low, but included a total of eight species from the 24 aquatic systems sampled. Arctic grayling were the dominant species collected, found typically in most streams characterized by gravel bed material. No fall spawning habitat was located in the vicinity of the proposed pipeline river crossings except for chum salmon. Chum salmon were found in the Kluane River, a river not crossed by the proposed pipeline, and one chum carcass was located in the Duke River, a short distance down-stream of the proposed pipeline crossing. No chinook or chum salmon redds were found. In 1976, chinook and chum salmon returned in abnormally low numbers. This would result in an underutilization of available spawning habitat. Although the possibility exists that little fall spawning habitat is located within the zone of influence of Foothills' proposed pipeline, it would be premature at this early stage in the study program to arrive at this conclusion confidently. This study represents the initial phase in a comprehensive study program of the aquatic resources. Results of studies scheduled in spring 1977 to collect emerging fry of fall spawners will provide additional data on fall spawning use of aquatic systems in southern Yukon Territory.

#17

Beak Consultants Ltd., 1977. A survey of fall spawning fish species in waterbodies within the influence of the proposed Alaska Highway Pipeline in Yukon Territory, 1977. Prepared for Foothills Pipe Lines (Yukon) Ltd. 40 pages.

Abstract

Foothills Pipe Lines (Yukon) Ltd. have proposed the development of a natural gas pipeline that would traverse the southern section of Yukon Territory. The construction, maintenance and operation of this pipeline has the potential for impairment of aquatic environments. An inventory of the fish fauna in selected watercourses within the influence of this proposed pipeline was conducted from August 20 to November 10, 1977. The purpose of this investigation was to document fishery utilization of the aquatic environment during the fall season. This program was designed to identify waterbodies which were used by fall spawning fish populations, and to identify migration times, routes and spawning areas as they relate to possible impact from the proposed pipeline. Potential fish overwintering areas in watercourses directly affected by the proposed pipeline alignment were also identified. These data will be used to supplement existing information on utilization and sensitive periods of fish fauna and to assess fully the impact of the proposed pipeline on the aquatic resource. Chinook and chum salmon were collected or observed in many waterbodies during this investigation. A summary of salmon utilization in regions within the influence of the proposed pipeline is presented. In the southern section of Yukon Territory, chinook salmon began arriving in spawning areas near the middle of August. Spawning activity peaked near the end of August in 1977. Chum salmon were first detected near spawning sites in southern Yukon Territory on September 27, 1977. Numbers of fish in these areas increased on subsequent days and spawning activity appeared to peak about October 22, 1977. In Bear Creek, Dolly Varden spawning activity began in early September when water temperatures were approximately 5.0 C. Areas which possessed suitable spawning substrate were found throughout the creek. Most spawning areas were small and no more than three Dolly Varden were observed in any of these regions. Many fish appeared to have migrated out of the region of this watercourse above the Alaska Highway. These fish may have moved to other spawning sites. In Kluane Lake, lake trout spawning appeared to have occurred from mid-September to late October. No spawning areas were identified during this investigation.

#18
Beak Consultants Ltd., 1977. Winter fish investigations of selected watercourses in Yukon Territory, 1977. Prepared for Foothills Pipe Lines (Yukon) Ltd. 13 + pages.

Abstract

Watercourses along the proposed pipeline route which will be crossed during winter construction were investigated from March 16 to March 20, 1977. A total of seventeen watercourses were investigated. Of these seventeen, six watercourses were judged to exhibit overwintering potential for fish fauna. These rivers will require further investigation during the winter of 1977 - 1978 to determine the fish fauna present during the winter season, the physical location of overwintering areas, if any, and the relative abundance of the fauna present. The majority of watercourses investigated in this survey did not exhibit overwintering potential for fish fauna. Of the seventeen rivers and streams surveyed, eleven were of this category with winter pipeline construction preferred. Five rivers (White, Koidern, Donjek, Duke and Kluane Rivers) and one creek (Snag Creek) were judged capable of supporting overwintering populations of fish, and additionally, appear suitable for overwinter egg incubation of fall spawning fish species. Further study is needed of these six watercourses to determine if actual fish overwintering occurs, and to assess the implications of winter pipeline construction. The data collected from this survey reduces the number of streams of potential concern to winter pipeline construction.

#19

Bodaly, R. A. 1979. Morphological and ecological divergence within the lake whitefish (Coregonus clupeaformis) species complex in Yukon Territory. J. Fish. Res. Board Can. 36:1214-1222.

Abstract

Eighty-nine lakes in the Yukon Territory and adjacent areas in northern B.C., in the drainage basins of the Yukon, Alsek, Upper Liard and Peel rivers were fished by gillnet between 1968 and 1975. Two forms of lake whitefish were found in each of 5 lakes in Yukon Territory: Squanga, Little Teslin, Teenah, Deza-deash and Hanson lakes. They are characterized by differences in gill raker counts. The naturally occurring fish fauna of Hanson Lake was exterminated in 1963 for the purpose of planting rainbow trout. Only northern pike are found in the lake at present.

#20

Bodaly, R.A. and C.C. Lindsey. 1977. Pleistocene watershed exchanges and the fish fauna of the Peel river basin, Yukon Territory. J. Fish. Res. Board Can. 34 : 388-395.

Abstract

The Peel River basin is a unique Canadian glacial refugium containing many relict fish populations. Peel River is presently tributary to the Mackenzie River system, but at least twice during Pleistocene glaciations it was diverted into headwaters of the Yukon River system, offering the possibility of two-way transfer of aquatic organisms between the Mackenzie and Yukon. Present fish distributions in the Peel basin are summarized. Biochemical and morphological evidence suggests that races of at least six species now inhabiting the area (Coregonus clupeaformis, Prosopium coulteri, Thymallus arcticus, Salvelinus namaycush, Esox lucius, Cottus cognatus) originated from types which either came from the Yukon River system or developed in situ in unglaciated parts of the Peel.

#21
Boland, J. P. 1973. The Yukon fishery resource. Its existing role and its future potential. Economics Unit, Northern Operations Branch, Fish. Mar. Ser., Pacific Region, D.O.E. NOB/Econ. 1-73, 43 pages.

Abstract

This study presents an overview of the fishery resource activities of people living in the Yukon. It includes a section on each of the three main fishing activities: commercial fishing, sport fishing, and subsistence food fishing. It specifically focuses on the influence these activities have on the residents of the Yukon.

The sport fishery makes a considerable contribution to the Yukon economy with a significant number of residents receiving a portion of their income as a result of this fishery.

At present the Yukon's commercial fishery is very small but opportunities for future growth do exist. The main method used for catching salmon are fish wheels.

A significant number of the Yukon's native Indian people make use of their right to subsistence fish. The report suggests that Indians living in more remote locations are more dependent on fishing than Indians living in the more populated areas.

#22
Boughton, R.V. 1966. The annual production of the whitefishes Coregonus clupeaformis and Coregonus nasus in Teslin Lake, B.C. Northwest Sci. 40: 147-154.

Abstract

Teslin Lake supports eleven species of fish. Of these Coregonus clupeaformis, the lake whitefish, C. nasus, the broad whitefish, Prosopium cylindraceum, the round whitefish, and Catostomus catostomus, the longnose sucker, are bottom feeders. The calculation of the annual yield, however, has been restricted to that for Coregonus clupeaformis and C. nasus for two reasons: first, because they are of commercial importance owing to their sizes and numbers, and second, because they feed on bottom organisms for which quantitative data have been secured. Several assumptions have beem made in the calculations. Reserving 10,000 to 15,000 for the local population, it would appear that 40,000 to 50,000 pounds might be taken from the lake annually in a commercial fishery. If Teslin Lake is ever opened up for commercial fishery, the authors suggest that it be kept under direct scientific control.

§23
Brock, D. N. 1976. Distribution and abundance of chinook and chum salmon in the upper Yukon River system in 1974, as determined by a tagging program. Fish. Mar. Ser. Tech. Rep. PAC/T-76-3. 56 pages.

Abstract

During the 1974 Yukon River tagging program a total of 727 chinook salmon (Oncorhynchus tshawytscha) and 1,276 chum salmon (Oncorhynchus keta) were tagged with Peterson disc and spaghetti tags 48.3 km. below Dawson City. The tag recovery program showed a greater incidence of Peterson disc-tagged salmon than spaghetti-tagged salmon. The program indicated that a large portion of the chinook and chum salmon populations are mainstem spawners. Mainstem chinook salmon were found spawning at the Ingersol Islands, Yukon Crossing, and the outlet of Lake Laberge while chum salmon were found spawning in a clear water side channel of the Yukon River adjacent to kilometer 212 of the Klondike Highway. Population estimates for chinook range from 11,000 to 36,700 and for chum salmon from 8,960 to 31,352. Information on length, sex, age composition, gear selectivity and migration rates for both salmon species is included in this report.

#24

Brown, R. F., M. S. Elson, and L. W. Steingenberger, 1976. Catalogue of aquatic resources of the upper Yukon River drainage (Whitehorse area). D.O.E. Fish. Mar. Ser. Tech. Rep. PAC/T-76-4. 149 pages.

Abstract

Eighteen species of fish have been recorded from the upper Yukon River drainage, of which 3 species have been introduced and one species is probably no longer present. Spawning periods for these species in the upper Yukon River drainage are given. Physical, chemical and biological information is given for each of 7 major tributary systems: the Atlin Lake, Tagish Lake, Bennett Lake, Marsh Lake, Takhini River, Lake Laberge and Yukon River drainages. Exploitation of the fish stocks is discussed. A description of dams present in the system and their effect on fishery stocks is given. A summary of fish stocking programs in the drainage is presented.

#25

Buckles, D. 1982. (In preparation). Allocating fisheries resources for fly-in sports fishing camps. Information and Policy Branch. Department of Renewable Resources. Y.T.G.

Abstract

This report summarizes the history of allocations decisions with regards to the fishery resource. The author argues that before fisheries resources can be allocated determinations must be made of (1) what the resource can yield and (2) which user groups have priority.

NOTE: This information was gathered in a telephone conversation with the editor. The report has not been seen.

#26

Burns, B. 1981. Methods, environmental impacts, treatment and control, reclamation and revegetation and management of placer mining in Yukon Territory. Draft. Prepared for Westwater Institute, University of British Columbia.

Abstract

This brief report summarizes information on placer mining in the north. Five areas were explored (1) methods of placer mining, (2) environmental impacts, (3) treatment and control, (4) reclamation and vegetation, (5) management.

A section on aquatic life outlines the direct and indirect effects of placer mining on the fisheries resource. No new information is presented.

#27
Canada, Department of the Environment. 1979. Water chemistry and biological conditions in the watershed near Mount Nansen mines Ltd. Yukon Territory. E.P.S. Regional Program Report: 79-12, 16 pages.

Abstract

Mount Nansen mines are located in the Dawson range about 30 miles west of Carmacks. The area surrounding the mine is drained by the headwaters of the Nisling River. Effluent from the tailings pond flows into an unnamed creek which travels about 5 kilometers before draining into Victoria Creek.

The water chemistry and biological conditions (benthic invertebrates, fish) in the Victoria Creek watershed near Mount Nansen Mines were examined in 1976 and 1977. Fish were collected from two sites on the Victoria Creek using an electrofisher, to determine which species were present and to analyze fish tissue for heavy metals. Twenty-four grayling were captured at station 4 and thirty-five grayling were captured at station 5. The results of fish sampling for heavy metals did not indicate any metal levels of concern. There was a marked improvement in the quality of tailings decant from 1976 to 1977 as well as in te toxicity of the decant. The creek receiving the decant had a much reduced bottom fauna population but the bottom fauna and fish population in Victoria Creek showed little impact from the decant.

#28

Canada, Department of the Environment. 1978, Assessment of the water quality and biological conditions in watersheds surrounding the United Keno Hill Mine, Elsa, Yukon, during the summers of 1974 and 1975. Canada, Department of the Environment. E.P.S. Regional Program Report: 78-14. 26 pages.

Abstract

Surveys were conducted during the early summer of 1974 and 1975 at United Keno Hill Mines in the Yukon Territory. The parameters examined included water chemistry, trace metals, benthic species diversity, fish concentrations and toxicity testing. Sampling sites were located in two watersheds. The main watershed under consideration was associated with the South McQuesten River and received the decant water from the tailings pond below the mine's milling operation. The other watershed examined briefly was the Lightning Creek/Thunder Gulch watershed where a small placer gold mining operation was located. Electrofishing with barrier nets downstream was used to capture fish.

The greatest number of fish were collected along the South McQuesten River, while only one pike was caught in Flat Creek. One grayling was caught on Lightning Creek, downstream from the placer mining operation.

The results indicated that zinc concentrations as high as 2.0 ppm were present in the waters of Flat Creek below the tailings pond decant. Copper, cadmium, and lead concentrations were found to to be above the limits of the water use licence, intermittently. Benthic species diversity and fish density were reduced in Flat Creek below the tailings pond decant. Bioassay samples collected from the tailings pond decant were found to be toxic on two occasions out of twelve sampling times.

#29
Canada, Department of the Environment, 1976. Environmental Design for Northern Road Developments Report. EPS-8-EC76-3.

Abstract

This report recommends environmental protection measures to minimize adverse effects on the environment from northern road developments. The measures presented are based on experience gained in the environmental review of the MacKenzie Highway and proposed MacKenzie Valley Pipeline projects and on the advice of environmental and engineering experts.

The road development process is presented in six sequential phases: preliminary route selection, the environment survey, the alignment selection and route field survey, design, construction and finally, maintenance. In the initial phases of development the participation of those responsible for environmental protection is emphasized. In the latter phases specific measures for environmental protection are given for individual highway activities.

Includes guidelines for necessary fisheries studies, watercourse selection, stream crossing design, construction of drainage and erosion, stream crossings, drainage and erosional control maintenance, stream crossings maintenance.

Appendix B includes erosion and drainage control practices. Appendix C includes guidelines for fish passage through culverts.

#30

Canada, Department of Environment, 1973. Catalogue of fish and stream resources of the Teslin Watershed. Tech. Rep., Fish. and Mar. Ser. PAC/T-73-13, 47 pages.

Abstract

Fourteen species are represented in the fish stocks of the Teslin Watershed. These are: humpback whitefish, broad whitefish, lake herring, round whitefish, inconnu, grayling, lake trout, chinook salmon, chum salmon, longnose sucker, northern pike, burbot, slimy sculpin and Arctic lamprey.

Physical, chemical and biological characteristics are presented for each of the 8 major tributary systems: Gladys River, Hayes River, Jennings River, Morley River, Nisutlin River, Swift River, Teslin River and Upper Teslin River. Detail on life history and abundance is known to a limited degree for chinook salmon only. The total run of chinook in the Teslin system is estimated to be 3,700 - 8,600 fish annually. Relatively good numbers spawn in the Teslin River (2,000 - 5,000) and others pass through Teslin Lake to spawn in the drainages of the Nisutlin River (1,000 - 2,000), Morley River (200 - 500), Swift River (100 - 300), Upper Teslin river (100 - 200), Gladys River (100 - 200), Hayes River (100 - 200) and Jennings River (100 - 200). Unconfirmed sightings of chinook salmon have been reported in a number of smaller tributary streams. Chum salmon allegedly spawn in a slough upstream of Roaring Bull Rapids but their numbers are unknown.

#31
Canada, Department of the Environment, 1973. Statement of Fisheries Service concerns and responsibilities presented to the Yukon Territorial Water Board Inquiry into the placer mining industry. Canada, Department of the Environment, Fish. Mar. Ser., November, 1973. 19 pages.

Abstract

This brief outlines the main implications that placer mining activities have on the indigenous fish stocks of the Yukon gold fields. Placer mining activities as they are presently conducted would destroy fish production in the assiciated streams as illustrated by the examples of Bonanza and Hunker Creeks. Spawning and fish food producing substrates can be blanketed or buried with silt so that the streams are no longer capable of producing either fish or fish food. Available technology to overcome the detrimental effects on fish associated with placer mining is presented. The water use situations which the Fisheries and Marine Service may control under the Fisheries Act are given. Recommendations concerning the control of placer mining activities in the Yukon as they relate to fish and fish habitat protection are included.

#32
Canada, Department of Environment, 1972. Fish power studies northern B.C. and Yukon. Preliminary Report, April 1972. Energy Study Group, Environmental Quality Unit, Fish. Mar. Service. 31 pages.

Abstract

The report deals with 6 hydro power projects in B.C. and Yukon which are under investigation by the Fisheries Service: Alcan, Skeena, Stikine-Iskut, Aishihik, Whitehorse and Mayo. Fisheries problems posed by the developments are described and planned studies in each area are outlined. No new fisheries data is presented.